Protocol for
testing adsorption capacity of protein

Determination of adsorption capacity of proteins

Appropriate volume (according to the concentration of proteins) of 3/4/6A-SUP and 3B were mixed together and incubated for 2 hours. Then, uranyl solution was prepared in Tris buffer and was modulated to be around pH7.0. Next, the uranyl solution was transferred into incubated proteins and mixed up thoroughly by shaking. The absorption reaction continued for 1 min. The mix was transferred into 3kDa cutoff centrifuge filters immediately and centrifugated for 10 min at 14000g. Finally, 100μL filtrate was collected to determine the concentration of left uranyl.

Here is an example of our sample addition tables

	3A-SUP+3B
U/μL	10
TBS buffer/μL	350
Ac buffer/μL	10
add TBS buffer/μL	21.8
protein/μL	6.11+2.09
add to/μL	400

Arsenazo III determination of uranyl (for solutions concentration beyond 1uM)

A modification of the Arsenazo III method was employed to determine uranyl concentrations in our experiments. To obtain a standard curve of uranyl concentration, 100μL of 80 μM Arsenazo III containing 0.1 M HCl was titrated with an equal volume of uranyl solutions whose concentrations ranging from 0 to 40 μM. The uranyl solutions were prepared in Tris buffer and were adjusted to pH 7.0. Then the absorbances at 652 nm and 800 nm were monitored by Thermo Scientific Microplate Reader. The value of A652-A800 increases linearly in this range, which can be converted to uranyl concentrations.

ICP-MS determination of uranyl

ICP-MS was used to determine uranyl solutions whose concentrations were lower than 1uM. In our experiments, we collected 100μL filtrate of solutions containing 666nM and 13nM uranyl respectively and then diluted the filtrate to 25 fold. Finally, the filtrate was sent to a test center in our university.